

WHAT IS CLAIMED IS:

1. A laser apparatus comprising:
 - an optical system for sampling a part of a laser beam emitted from an
5 oscillator;
 - a sensor for generating an electric signal including fluctuation in
energy of the laser beam as a data from the part of the laser beam;
 - a means for performing signal processing to the electrical signal to
grasp a state of the fluctuation in energy of the laser beam, and controlling a relative
10 speed of an beam spot of the laser beam to an object in order to change in phase with
the fluctuation in energy of the laser beam.
2. A laser apparatus comprising:
 - an optical system for sampling a part of a laser beam emitted from an
15 oscillator;
 - a sensor for generating an electric signal including fluctuation in
energy of the laser beam as a data from the part of the laser beam;
 - a means for performing signal processing to the electrical signal to
grasp a state of the fluctuation in energy of the laser beam, and controlling a position of
20 an object in order to change a relative speed of an beam spot of the laser beam to the
object in phase with the fluctuation in energy of the laser beam.
3. A laser apparatus comprising:
 - an optical system for sampling a part of a laser beam emitted from an
25 oscillator;
 - a sensor for generating an electric signal including fluctuation in
energy of the laser beam as a data from the part of the laser beam;
 - a means for performing signal processing to the electrical signal to
grasp a state of the fluctuation in energy of the laser beam, and controlling a position of
30 a beam spot of the laser beam in order to change a relative speed of the beam spot to an

object in phase with the fluctuation in energy of the laser beam,
wherein a position of the object is fixed.

4. A laser irradiation method comprising:

- 5 sampling a part of a laser beam emitted from an oscillator;
 generating an electric signal including fluctuation in energy of the
laser beam as data;
 performing signal processing to the electrical signal to grasp a state of
the fluctuation in energy of the laser beam; and
10 controlling a relative speed of an beam spot of the laser beam to an
object in order to change in phase with the fluctuation in energy of the laser beam.

5. A laser irradiation method comprising of:

- sampling a part of a laser beam emitted from an oscillator;
15 generating an electric signal including fluctuation in energy of the
laser beam as data;
 performing signal processing to the electrical signal to grasp a state of
the fluctuation in energy of the laser beam; and
 controlling a position of an object in order to a relative speed of an
20 beam spot of the laser beam to the object in phase with the fluctuation in energy of the
laser beam.

6. A laser irradiation method comprising:

- sampling a part of a laser beam emitted from an oscillator;
25 generating an electric signal including fluctuation in energy of the
laser beam as data;
 performing signal processing to the electrical signal to grasp a state of
the fluctuation in energy of the laser beam; and
 controlling a position of a beam spot of the laser beam in order to
30 change a relative speed of the beam spot to an object in phase with the fluctuation in

energy of the laser beam, .

wherein a position of the object is fixed.

7. A method of manufacturing a semiconductor device, comprising:

- 5 sampling a part of a laser beam emitted from an oscillator;
 generating an electric signal including fluctuation in energy of the
laser beam as data form the part of the laser beam;
 performing signal processing to the electrical signal to grasp a state of
the fluctuation in energy of the laser beam; and
10 controlling a relative speed of an beam spot of the laser beam to a
semiconductor film in order to change in phase with the fluctuation in energy of the
laser beam,
 irradiating the laser beam to the semiconductor film to enhance
crystallinity of the semiconductor film.

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8. A method of manufacturing a semiconductor device, comprising:

- sampling a part of a laser beam emitted from an oscillator;
 generating an electric signal including fluctuation in energy of the
laser beam as data form the part of the laser beam;
20 performing signal processing to the electrical signal to calculate a
frequency, a amplitude, and a phase of the fluctuation in energy of the laser beam;
 controlling a relative speed of an beam spot of the laser beam to a
semiconductor film with a phase of a signal in synchronization with oscillation of the
laser beam emitted from the oscillator, a phase difference between the calculated phase
25 and the phase of the signal, a ratio of energy of the part of the laser beam to the laser
beam emitted form the oscillator, the calculated frequency, and the calculated amplitude
in order to change in phase with the fluctuation in energy of the laser beam; and
 irradiating the laser beam to the semiconductor film to enhance
crystallinity of the semiconductor film.

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9. A laser irradiation method comprising a step of controlling a relative speed of a beam spot of a laser beam to an object in order to change in phase with fluctuation in energy of the laser beam.

5 10. A laser irradiation method comprising a step of controlling a relative speed of a beam spot of a laser beam to an object at least a frequency and a amplitude of fluctuation in energy of the laser beam in order to change in phase with the fluctuation in energy of the laser beam.

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